

***In situ* microscopy of small particles at ambient temperatures**

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Salts are common constituents of atmospheric aerosols. Through the process called deliquescence they accumulate water to form droplets when the relative humidity is sufficiently high. The process is reversed (efflorescence) when the relative humidity decreases, although there is a marked hysteresis effect. The deliquescence and efflorescence reactions are important for understanding cloud formation and dissipation, and they thus have major implications for climate and climate change. However, there are important size effects when particles are small enough to be a few nanometers or less in diameter. We are studying these effects under controlled conditions using *in situ* microscopy. We are also studying complex particles collected in remote areas around the globe to examine the effects of changing relative humidities on aerosol particles that consist of intergrowths of more than one phase.